

REMARKS

The Official Action mailed January 5, 2004, has been received and its contents carefully noted. This response is filed within three months of the mailing date of the Official Action and therefore is believed to be timely without extension of time. Accordingly, the Applicant respectfully submits that this response is being timely filed.

The Applicant notes with appreciation the partial consideration of the Information Disclosure Statement filed on May 18, 2000. Specifically, it appears that the Examiner inadvertently overlooked the citation of the International Search Report in the "Other Documents" section of the Form PTO-1449. The Applicant respectfully requests that the Examiner provide an initialed copy of the Form PTO-1449 evidencing consideration of the International Search Report.

Claims 1 and 2 are pending in the present application, both of which are independent. Claims 1 and 2 have been amended to better recite the features of the present invention. For the reasons set forth in detail below, all claims are believed to be in condition for allowance. Favorable reconsideration is requested.

Paragraph 3 of the Official Action rejects claims 1 and 2 as obvious based on the combination of U.S. Patent No. 6,023,491 to Saka et al. and U.S. Patent No. 5,311,545 to Critchlow. The Applicant respectfully submits that a *prima facie* case of obviousness cannot be maintained against the independent claims of the present invention, as amended.

As stated in MPEP §§ 2142-2143.01, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some

teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

The prior art, either alone or in combination, does not teach or suggest all the features of the independent claims, as amended. Independent claims 1 and 2 have been amended to recite "a plurality of different PSK modulation methods (e.g., BPSK, QPSK, 8PSK) ... phase error tables (13, 14-1, 15-1) for respective ones of the plurality of PSK modulation methods ... a reception signal corresponding to a specific one of the PSK modulation methods ... the phase error table corresponding to the specific modulation method ... the reception signal corresponding to the specific one of the PSK modulation methods ... to correct the phase of the carriers using the read phase error data." For the reasons described in detail below, Saka and Critchlow do not teach or suggest at least the above-referenced features of the present invention.

The Applicant respectfully submits that the present invention is not rendered obvious by the combination of the cited prior art references of Saka and Critchlow. As is clearly recited in the claims as amended, the present invention provides a digital receiver which demodulates a PSK modulated signal obtained by modulating digital signals with a plurality of different PSK modulation schemes, (e.g., BPSK, QPSK 8PSK) having different phase numbers (e.g., 2, 4, 8) and time-multiplexing them, wherein a remapper 7 (i.e., inverse phase rotation means) inversely rotates a phase of received symbol data to perform absolute phasing, and wherein phase error data corresponding to the received symbol data after absolute phasing is read from a phase error table to correct a phase of a carrier wave using the read phase error data. Also, the present

invention having the above unique structure has a specific technical advantage in that a necessary capacity of memory can be largely reduced as compared to the prior art, because it is sufficient to provide only one phase error table for each of the PSK modulation schemes.

By contrast, Saka only discloses a receiver that operates to demodulate a received signal of a single modulated signal (i.e., QPSK signal). Saka does not teach or suggest a plurality of different PSK modulated signals (e.g., BPSK, QPSK, 8PSK signals) being time-multiplexed, as claimed in the present invention. Thus, since the receiver of Saka serves to demodulate only the received QPSK signal, it is unnecessary for the receiver to be provided with the phase error tables as required in the present invention. Moreover, as conceded by the Official Action (page 3, Paper No. 8), Saka does not teach or suggest an "inverse phase rotation means" which is one important feature of the receiver of the present invention.

The Official Action asserts that Critchlow makes up the deficiency of the disclosure in Saka, because Critchlow allegedly discloses the "inverse phase rotation means." To support this assertion, the Official Action cites Figs. 2-4 and the description at column 5, lines 17-20, in Critchlow as follows: "An estimate of the absolute phase offset between transmitter and receiver is fed by way of the AFC loop 33 from the AFC bit tracking circuit 31 on the phase rotation circuit 22."

However, despite the above description in Critchlow, Critchlow neither teaches nor suggests the unique feature of the present invention, particularly, the "inverse phase rotation means" that operates to inversely rotate the phase of symbol data outputted from the demodulation means, as recited in claims 1 and 2. Rather, in Critchlow, it is the phase undemodulated signal (not the demodulated signal) that is rotated to perform absolute phasing.

By contrast, in the present invention, the rotational angle (Φ) of the demodulated symbol data (which occupies a specific position in the symbol constellation as shown, for example, in Fig. 13 of the subject application) is adjusted so as to perform absolute

phasing. In Critchlow it is to be noted that the AFC loop 33 exiting from the AFC 31 is fed back to the phase rotation circuit 22 which causes the signal phase to be rotated before demodulation. Thus, the present invention and Critchlow are distinguished from each other in the respect that the present invention operates to rotate the phase angle of the demodulated symbol data whereas Critchlow operates to rotate the phase of the undemodulated signal.

Furthermore, Critchlow does not teach or suggest that the control operation is performed by two steps: (i) the phase of the demodulated symbol data is rotated for absolute phasing; and (ii) the phase of the carrier wave is corrected using the phase error data corresponding to the symbol data with the absolute phasing being provided, as claimed in the present invention.

Still further, even if Saka and Critchlow are combined, the combined device does not teach or suggest a plurality of different PSK modulated signals (e.g., BPSK, QPSK, 8PSK signals) being time-multiplexed, as claimed in the present invention.

Accordingly, Critchlow does not cure the deficiencies in Saka, and even if Saka and Critchlow are combined, the resulting combination does not teach or suggest all the features of the present invention as recited in the claims.

In summary, Saka only discloses a receiver apparatus that demodulates a single modulated wave (i.e., QPSK signal). Therefore, Saka does not recognize the problem in the prior art that a memory capacity becomes larger, because a plurality of phase error tables must be provided for each of a plurality of modulation schemes, which the present invention solves. Accordingly, Saka does not teach or suggest a solution to that problem. In fact, Saka does not teach or suggest an "inverse phase rotation means (or the remapper 7)" for inversely rotating a phase of symbol data to perform absolute phasing. Critchlow does not cure the above deficiencies in Saka. Critchlow is relied upon to allegedly teach an inverse phase rotation means. However, in Critchlow, it is the phase undemodulated signal (not the demodulated signal) that is rotated to perform absolute phasing; therefore, Critchlow also does not teach or suggest the inverse phase

rotation means that operates to inversely rotate the phase of symbol data outputted from the demodulation means, as recited in claims 1 and 2. Also, Saka and Critchlow, either alone or in combination, do not teach or suggest at least a plurality of different PSK modulation methods (e.g., BPSK, QPSK, 8PSK), phase error tables (13, 14-1, 15-1) for respective ones of the plurality of PSK modulation methods, a reception signal corresponding to a specific one of the PSK modulation methods, the phase error table corresponding to the specific modulation method, and the reception signal corresponding to the specific one of the PSK modulation methods, in order to correct the phase of the carriers using the read phase error data.

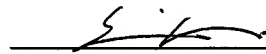
Since Saka and Critchlow do not teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot be maintained.

Furthermore, there is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify Saka and Critchlow or to combine reference teachings to achieve the claimed invention. The Official Action alleges that Critchlow teaches a component corresponding to the "inverse phase rotation means" of the present invention. However, even assuming that the component disclosed in Critchlow formally corresponds to the "inverse phase rotation means" of the present invention, there is nothing to teach or suggest to one skilled in the art that the technique of Critchlow should or could be applied to the constitution of Saka, because neither Critchlow nor Saka recognize the problem which the present invention confronts and its solution, as stated above.

For the reasons stated above, the Official Action has not formed a proper *prima facie* case of obviousness. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) are in order and respectfully requested.

Should the Examiner believe that anything further would be desirable to place this application in better condition for allowance, the Examiner is invited to contact the Applicant's undersigned attorney at the telephone number listed below.

Respectfully submitted,



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